Space Weather Forecast

Issued on Friday, 18 November 2022 at 13:26 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Slight chance of Moderate flares (Minor to Moderate radio blackouts) throughout. Chance of G1 (Minor Storm) on 20 and 21 November.

Analysis of Space Weather Activity over past 24 hours
Solar Activity: Solar activity has been Low over the last 24 hours, but with a recent increase in the frequency of mid-range Common class flares, due to flares emanating from two complex regions which crossed over the western limb in the last 24 hours. There are three developing but relatively simple and inactive sunspots on the visible disc, with a further unnumbered region in the northwest quadrant. A CME was seen projecting from the regions just beyond the northwest limb, and although this will be analysed as imagery becomes available, this is not expected to be Earth-directed. No Earth-directed Coronal Mass Ejections (CMEs) have been observed in available imagery.

Solar Wind / Geomagnetic Activity: The solar wind has been predominantly slow with a declining trend through the last 24 hours, despite the effects of a glancing blow from a weak and slow moving CME (coronal mass ejection). Total magnetic field strength has been weak, but the north-south component has been persistently but weakly negative since mid-morning UTC due to the effects of the weak CME. Geomagnetic activity was Quiet.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) remained at background levels with no solar radiation storms.

Four-Day Space Weather Forecast Summary
Solar Activity: Solar activity is expected to be mainly Low or Very Low, with a slight but decreasing chance of M-class flares, due to the continued activity from the two complex regions which recently rotated across the western limb.

Solar Wind / Geomagnetic Activity: A weak CME is currently affecting the Earth, with slow speeds and weak geomagnetic signatures. No further Earth-directed CMEs are forecast.
Solar winds speeds are forecast to be at mainly background levels on 18 November, with limited effects from the recent CME arrival. Speeds are then likely to increase either late on 19 November, but most likely on 20 November due to the onset of a fast solar wind, giving speeds in the region of 500km/s. These speeds are then expected to continue through 21 November.
Geomagnetic activity is forecast to be mainly Quiet to Unsettled through 18 November, with a low chance of Active due to CME effects. Unsettled to Active intervals are then expected to develop either late on 18 November, but most likely through 20 and then 21 November, due to the connection with the high speed stream, giving a chance of G1/Minor Storms.
Energetic Particles / Solar Radiation: The count rate of energetic particles (High energy protons) is most likely to persist at background levels. However, there is initially a slight chance of a solar radiation storm from the two former large and complex sunspots, now located beyond the northwest limb.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	10	20	30	30
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	No	20	10	10	10
Very Active	R3 to R5 X	No	5	1	1	1

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	5	2	1	1
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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